

LISTING OF CLAIMS

Claims 1-22 (Previously Canceled)

23. (Previously Amended) An apparatus comprising:

a manipulandum comprising a plurality of surfaces forming a volume, said manipulandum movable in at least one degree of freedom;

a sensor operable to detect a position of said manipulandum and a deviation of said manipulandum from said position and to output a first sensor signal associated with said deviation of said manipulandum from said position;

an actuator disposed in said volume of said manipulandum, said actuator operable to provide tactile feedback to said manipulandum associated with said first sensor signal; and

a first processor operable to control said actuator and to receive said first sensor signal from said sensor.

24. (Previously Amended) An apparatus as recited in claim 23 wherein said manipulandum comprises a roller.

25. (Previously Amended) An apparatus as recited in claim 24 wherein said roller communicates an electrical signal output to said first processor.

26. (Previously Amended) An apparatus as recited in claim 24 wherein said roller is moveable in two degrees of freedom.

27. (Previously Amended) An apparatus as recited in claim 26 wherein said two degrees of freedom comprise a rotary degree of freedom and a translatory degree of freedom.

28. (Previously Amended) An apparatus as recited in claim 23 further comprising a local display screen.

29. (Previously Amended) An apparatus as recited in claim 23 further comprising a microphone.

30. (Previously Amended) An apparatus as recited in claim 23 wherein said first processor is included in a video game console.

31. (Previously Amended) An apparatus as recited in claim 23 wherein said first processor is included in a computer.

32. (Previously Amended) An apparatus as recited in claim 23 wherein said first processor is included in a Web-access device.

33. (Previously Amended) An apparatus as recited in claim 23 wherein said first processor is included in an electronic device.

34. (Previously Amended) An apparatus as recited in claim 23 further comprising a second processor, separate from said first processor and operable to communicate with said first processor.

Claims 35-57 (Previously Canceled)

58. (Previously Presented) An apparatus as recited in claim 28 wherein said local display screen further comprises a touch-sensitive surface.

59. (Previously Presented) An apparatus as recited in claim 23 wherein said sensor is operable to detect an amount of said deviation of said manipulandum from said position and to output a second sensor signal associated with said amount of said deviation of said manipulandum from said position, said first processor operable to receive said second signal.

60. (Previously Presented) An apparatus as recited in claim 23 wherein said first processor is operable to associate a value with said position of said manipulandum in a position control mapping mode and to control a rate of change of said value in a rate control mapping mode.

61. (Previously Presented) An apparatus as recited in claim 60 wherein said first processor is operable to control said tactile feedback to said manipulandum in said rate control mapping mode.
62. (Previously Presented) An apparatus as recited in claim 60 wherein said actuator is operable to output a force detent during a displacement of said manipulandum in said position control mapping mode.
63. (Previously Presented) An apparatus as recited in claim 60 wherein said rate of change associates with a displacement of said manipulandum with respect to said position of said manipulandum.
64. (Previously Presented) An apparatus as recited in claim 63 wherein said first processor is operable to control said position of said manipulandum in said rate control mapping mode.
65. (Previously Presented) An apparatus as recited in claim 64 wherein said first processor is operable to control a biasing force applied to said manipulandum in a direction toward said position in said rate control mapping mode.
66. (Previously Presented) An apparatus as recited in claim 23 further comprising a wireless communication interface operable to communicate with said first processor.

67. (Previously Presented) An apparatus as recited in claim 23 wherein said deviation comprises a distance.

68. (Previously Presented) An apparatus as recited in claim 23 wherein said deviation comprises a direction.

69. (Previously Presented) An apparatus as recited in claim 23 wherein said deviation comprises a rate of change.

70. (Previously Presented) An apparatus as recited in claim 23 wherein said deviation is measured substantially in real-time.

71. (Previously Amended) An apparatus comprising:

a manipulandum comprising a plurality of surfaces forming a volume, said manipulandum operable to be displaced in at least one degree of freedom;

a sensor operable to detect a motion of said manipulandum and to output a first signal associated with a detected motion of said manipulandum;

an actuator disposed within said volume of said manipulandum, said actuator operable to output a force to said manipulandum associated with said first signal;

a first processor operable to control said actuator and to receive said first signal from said sensor; and

a second processor in communication with said first processor, said second processor operable to control said first processor.

72. (Previously Presented) An apparatus as recited in claim 71 wherein said manipulandum is movable in two degrees of freedom, said two degrees of freedom comprising a rotary degree of freedom and a translatory degree of freedom.

73. (Previously Presented) An apparatus as recited in claim 71 wherein said sensor is operable to detect a first position of said manipulandum, a second position of said manipulandum, and an amount of a deviation between said first and second positions and to output a second signal that associates with said first position, a third signal that associates with said second position, and a fourth signal that associates with said amount of said deviation, said first processor operable to receive said second, third, and fourth signals.

74. (Previously Presented) An apparatus as recited in claim 73 wherein said first processor is operable to associate a value with said first position of said manipulandum in a position control mapping mode and to control a rate of change of said value in a rate of control mapping mode.

75. (Previously Presented) An apparatus as recited in claim 74 wherein said first processor is operable to control said force to said manipulandum in said rate control mapping mode.

76. (Previously Presented) An apparatus as recited in claim 74 wherein said actuator is operable to output a force detent during a displacement of said manipulandum in said position control mapping mode.

77. (Previously Presented) An apparatus as recited in claim 74 wherein said rate of change associates with a displacement of said manipulandum with respect to said first position of said manipulandum.

78. (Previously Presented) An apparatus as recited in claim 77 wherein said first processor is operable to control said first position of said manipulandum in said rate control mapping mode.

79. (Previously Presented) An apparatus as recited in claim 78 wherein said first processor is operable to control a biasing force applied to said manipulandum in a direction toward said first position in said rate control mapping mode.